REMARKS/ARGUMENTS:

Claims 1-37 and 39-40 are pending in this Application, claim 38 having been previously canceled. In the final Office Action dated November 28th, 2005, the Examiner has allowed all method claims (13-22 and 34-35) and has finally rejected all apparatus claims as follows: claims 23-32 and 36 under 35 USC 102(b) as being anticipated by de Couasnon, and claims 1-12, 33, 37 and 39-40 under 35 102(e) as being anticipated by Lozano. Of the rejected claims, claims 1, 23 and 37 are independent.

The Applicants thanks the Examiner for withdrawing the previous rejections under 35 USC 101 and 112.

The Office Action asserts in essence that the disparity in allowance between method and apparatus claims arises because the apparatus claims do not structurally distinguish over the prior art. Specifically, the final Office action recites at page 2:

> MPEP 2114 states that while features of an apparatus may be recited structurally or functionally, claims directed to an apparatus must be distinguished over the prior art in terms of structure rather than function."

As will be shown, each of the rejected independent apparatus claims in fact recite structure that distinguishes over the art cited against those claims.

Dependent claims 5-6, 8-11, 25-26 and 28-31 each recite structure in unequivocal spatial terms (e.g., arcuate surface; symmetrical spacing of points about an origin; sphere; concentric spheres; distance between points). These recite structure of constellation points in spatial terms that can be readily modeled in three-dimensional physical space. Neither de Couasnon nor Lozano disclose a signal constellation with these particular spatial relations among the stipulated real dimensions recited in the independent claims from which they depend, and for that reason should be allowable.

A dichotomy exists between the above dependent claims, which recite structure in spatial terms, and independent claims 1, 23 and 37 that recite structure mathematically. The Applicants are unaware of any requirement that structural relation between elements of an apparatus claim cannot be recited mathematically. While the rejected independent

apparatus claims may not recite structure in a manner that may be readily modeled or imagined in the physical world, that fact reflects a limitation of three-dimensional physical space and not a lack of structure in the claimed signal constellations. Claims that recite structure mathematically cannot be rejected for that fact alone.

Claim 1 recites in relevant part:

> a plurality of constellation points disposed among n real dimensions, wherein each said point lies within one and only one of at least two n-1 real dimensional sub-constellations, wherein $n=2M$ and M is an integer greater than one, said plurality of constellation points embodied in or on a storage media

Claim 23 recites in relevant part:

> storage means having stored upon it a digital representation of at least one n-dimensional real signal constellation defining a plurality of points, wherein each and every said point lies within one and only one of at least two $(n-1)$-dimensional real sub-constellations, wherein $n=2M$ and M is an integer greater than one

And claim 37 recites in relevant part:

> storage means having stored upon it a digital representation of at least one n-dimensional real signal constellation defining a plurality of points, wherein each and every said point lies within one and only one of at least two $(n-1)$-dimensional real sub-constellations, wherein $n=2M$ and M is an integer greater than one

Now consider the signal constellation of 24 points illustrated below.
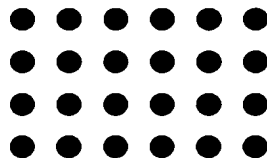
Claims 1, 23 and 37 each recite that the total signal constellation lie in n real dimensions, where $n=2M$ and M is an integer. The total constellation must then lie only in an even number of real dimensions. If M=1, then the constellation lies in two real dimensions, a concept that may be readily modeled in physical space by disposing a plurality of points in the x and y dimensions on a sheet of paper as in the illustrated constellation above. Since these claims also recite that each point lies in a sub-constellation of $(n-1)$ real dimensions, then each sub-constellation might consist of those points lying along a row x or a column y of the illustrated constellation. This is clearly a structural relation though it is recited
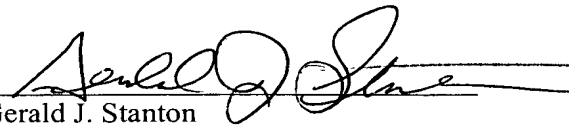
mathematically. It may not prescribe one particular arrangement of points, but there is no requirement that a claim to a signal constellation be limited to one embodiment; the structural relation exists in the dimensional disposition of the sub-constellations of points with respect to the total signal constellation.

Now consider a further element of claims 1, 23 and 37, that the integer M is greater than one. Added to the above element $n=2M$, this means that the total signal constellation must be disposed among at least $n=4$ real dimensions. We can no longer physically model this arrangement due to the physical world's limit of three real dimensions, but the underlying structural relation among sub-constellations of points to the total signal constellation remains. Setting M=2 we may still physically model the *sub*-constellations as points about a three-dimensional sphere ($n-1=3$), but we cannot physically model the four real dimensioned total signal constellation. Regardless, these claims recite structure mathematically that is not disclosed in or obvious from the cited art.

If the above-illustrated signal constellation in two real dimensions with sub-constellations each in one real dimension recites structure, then claims 1, 23, and 37 necessarily recite structure because they merely impose the further limitation over the illustrated constellation that M is greater than one. Because no cited reference discloses such a relation between sub-constellations of a signal constellation and the total constellation itself, and the Office Action does not assert that any reference does, claims 1, 23 and 37 as well as their dependent claims 2-12, 24-36, and 39-40 are seen as patentable.

The Applicants respectfully request the Examiner to reconsider and withdraw the claim rejections and to pass claims 1-37 and 39-40 to issue. The undersigned representative welcomes the opportunity to resolve any formalities or other matters that may remain via teleconference, at the Examiner's discretion.

Respectfully submitted:

_____   ____January 18, 2006____
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